

Sub F1

17. (amended) A computer mouse device for tracking user input and providing tactile feedback, said mouse device comprising:

a housing [including a lower portion and a casing portion, said lower portion] designed to move over a separate flat surface, said [casing portion] housing designed to be engaged by a palm of a user's hand when said [lower portion] housing is in contact with said flat surface;

a sensor provided within said housing that tracks the motion of said housing with respect to said flat surface, wherein motion data from said sensor is transmitted to a host computer for updating the status of a cursor on a graphical display displaying one or more graphical details;

B1

signal lines connecting said mouse device with said host computer, wherein said mouse device receives over said signal lines a sensory feedback signal from said host computer when said cursor displayed on said host computer interacts with one of said graphical details in response to said motion data; and

an actuator included within and coupled to said housing, said actuator generating motion of said [casing] housing in a direction substantially orthogonal to said flat surface, thereby delivering a tactile sensation to said user's palm when said palm is in contact with said casing, said actuator delivering said tactile sensation in response to said sensory feedback signal received over said signal lines.

18. A computer mouse device as recited in claim 17, wherein said actuator is capable of generating vibrations of varying frequency corresponding to different graphical details on said graphical display.

19. A computer mouse device as recited in claim 17 wherein said sensory feedback signal conveys a particular vibration frequency by a coding of pulse sequences.

20. A computer mouse device as recited in claim 17 wherein said actuator generates said motion in said entire housing of said computer mouse device.

21. A computer mouse device as recited in claim 20 further comprising a resilient material, said resilient material enabling said vibration by storing and releasing energy.

D2 Sub F3

22. (amended) A computer mouse device as recited in claim 17 wherein said housing includes a casing portion and a lower portion, wherein said actuator generates said motion in said casing portion with respect to said lower portion.

23. A computer mouse device as recited in claim 22 further comprising a resilient material, said resilient material being located within said housing between said casing portion and said lower portion.

24. A computer mouse device as recited in claim 17 wherein said actuator is an electromagnetic actuator.

25. A computer mouse device as recited in claim 17 wherein at least one of said graphical details is a border of a window.

26. A computer mouse device as recited in claim 17 wherein at least one of said graphical details is an icon.

27. A computer mouse device as recited in claim 17 wherein different graphical details are coded with different vibration frequencies so that a user can identify said graphical details by vibration frequency.

Sub F5
~~28. (amended) A computer mouse device as recited in claim 17 wherein said actuator generates motion of said [casing] housing by impacting said [casing] housing with a moving portion of said actuator.~~

~~29. (amended) A computer mouse device as recited in claim 28 wherein said actuator impacts said [casing] housing at a location underneath said palm of said user when said palm contacts said [casing] housing.~~

*D3
cont*
~~30. (amended) A computer mouse device for tracking user input and providing tactile feedback, said mouse device comprising:~~

~~a housing including a lower portion and [a casing] an upper portion, said lower portion designed to move over a separate flat surface, said [casing] upper portion designed to be engaged by the palm of a user when said lower portion is in contact with said flat surface;~~

~~a sensor provided within said housing for tracking motion of said housing with respect to said flat surface, wherein motion data from said sensor is transmitted to a host computer for updating the status of a cursor on a graphical display containing one or more graphical details;~~

~~signal lines connecting said mouse device with said host computer, wherein said mouse device receives over said signal lines a sensory feedback signal from said host computer when said cursor displayed on said host computer interacts with one of said graphical details in response to said motion data; and~~

D3
Concl'd

~~an actuator included within and coupled to said housing for generating up-down motion of said [casing] housing with respect to said flat surface, thereby delivering a bump sensation to said user's palm when said palm is in contact with said [casing] housing, said actuator delivering said bump sensation in response to said sensory feedback signal received over said signal lines.~~

31. A computer mouse device as recited in claim 30, wherein said actuator is capable of generating bump sensations of varying magnitude corresponding to different graphical details on said host computer's graphical display.

32. A computer mouse device as recited in claim 30, wherein said actuator is capable of generating vibrations of varying frequency corresponding to different graphical details on said host computer's graphical display.

33. A computer mouse device as recited in claim 30 wherein said sensory feedback signal conveys a particular vibration frequency by a coding of pulse sequences.

34. A computer mouse device as recited in claim 30 wherein said actuator generates said motion in said entire housing of said computer mouse device.

35. A computer mouse mouse device as recited in claim 34 further comprising a resilient material, said resilient material enabling said vibration by storing and releasing energy.

Sub I-8
36. (amended) A computer mouse device as recited in claim 30 wherein said actuator generates said motion in said [casing] upper portion with respect to said lower portion.

Sub I-15
37. (amended) A computer mouse device as recited in claim 36 further comprising a resilient element, said resilient element being located within said housing between said [casing] upper portion and said lower portion

38. A computer mouse device as recited in claim 30 wherein said actuator is an electromagnetic actuator.

39. A computer mouse device as recited in claim 30 wherein at least one of said graphical details is a border of a window.

40. A computer mouse device as recited in claim 30 wherein at least one of said graphical details is an icon.

Sub F10

41. A computer mouse device as recited in claim 30 wherein different graphical details are coded with different vibration frequencies so that a user can identify graphical details by vibration frequency.

Sub F10

42. (amended) A computer mouse device as recited in claim 30 wherein said actuator generates motion of said [casing] upper portion by impacting said [casing] upper portion with a moving portion of said actuator.

Sub C-13 D5

43. (amended) ~~A method for providing tactile feedback to a user of a mouse device in communication with a host computer, the method comprising:~~

Sub C-13 D5

providing motion signals to said host computer from said mouse device, wherein said motion signals represent motion of said mouse device on a flat surface;

receiving on said mouse device a sensory feedback signal from said host computer over signal lines, said sensory feedback signal being sent by said host computer when a cursor displayed on said host computer interacts with a graphical detail in response to said motion signals; and

generating a movement of a casing portion of said mouse device with respect to a bottom portion of said mouse device in response to said received sensory feedback signal, said movement being in a direction substantially orthogonal to said flat surface, said movement delivering a tactile sensation to said user's palm when said palm is in contact with said casing portion.

44. A method as recited in claim 43 wherein said actuator generates vibrations of varying frequency corresponding to different graphical details on said graphical display.

45. A method as recited in claim 43 wherein said sensory feedback signal conveys a particular vibration frequency by a coding of pulse sequences.

46. A method as recited in claim 43 wherein said actuator is an electromagnetic actuator.

47. A method as recited in claim 43 wherein at least one of said graphical details is a border of a window.

48. A method as recited in claim 43 wherein at least one of said graphical details is an icon.

Sub F13

49. A method as recited in claim 43 wherein different graphical details are coded with different vibration frequencies so that a user can identify graphical details by vibration frequency.

D6

50. (amended) A method as recited in claim 43 wherein said actuator generates movement of said casing portion by impacting said casing portion with a moving portion of said actuator.

51. (amended) A method as recited in claim 50 wherein said actuator impacts said casing portion at a location underneath said palm of said user when said palm contacts said casing portion.

52. (amended) A method as recited in claim 43 wherein said movement of said casing portion includes a slanting of said casing portion in one direction with respect to said bottom portion.

Sub F13

53. (amended) A method as recited in claim 43 wherein the cursor can be positioned within the borders of one of said graphical details, wherein said cursor is caused to remain within said borders until said cursor is released by said user pressing down said casing portion of said mouse device.